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Changes of cropland area in the river basins of the European part of Russia for the period 1985-2015 years, as a factor of soil erosion dynamics

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Abstract

© Published under licence by IOP Publishing Ltd. The work is devoted to the effect of the change of cropland area on the rate of soil erosion in sites of the European part of Russia located in different climatic, landscape and geomorphological conditions. Mapping of the croplands on the territory of 9 river basins for the two time slices (the middle of the 1980s, and the present-day period 2013-2015) was carried out by visual interpretation of multi-seasonal images Landsat 5 and Landsat 8. Using vector layers obtained as a result of digitization, the areas of croplands in the analyzed periods have been calculated, and changes which occurred in 30 years were estimated. The decrease of croplands area was revealed in all studied river basins. An assessment of the effect of cropland reduction on the soil loss rate was carried out. Using the SRMM DEM with a 30 m spatial resolution, the following morphometric characteristics of relief for cultivated and abandoned croplands were calculated: steepness of slopes, flowpath length, factor LS. Based on the results of calculations, the average values of the factor LS reduced from 1985 to 2015 on the croplands in all considered basins. The obtained data confirm that the reduction of the croplands area is one of the factors responsible for the decrease of modern soil loss rates observed in field studies.

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